

Some studies of subwavelength focusing and open cavity achieved with photonic crystals of negative refraction

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Materials or structures exhibiting negative refraction have attracted much attention recently within the community. A well-known example is a negative index material (NIM; also called a left-handed material), whose permeability and permittivity are simultaneously negative over a certain frequency band. Effectively negative permeability and permittivity can be obtained over a certain microwave band for arrays of wires and split-ring resonators. LHMs with simultaneously negative permittivity and permeability have many amazing properties, such as the subwavelength focusing and open cavity. As another important example of negative refraction, a specially designed photonic crystal can also refract light at a negative refraction angle. The performances of subwavelength focusing and open cavity of photonic crystals of negative refraction will be studied and compared with those of LHMs.